Choices for Surface Water Design Requirements

CITY COUNCIL STUDY SESSION

SEPTEMBER 20 , 2016

Goal

- Brief Council on research and findings since July 5th Council meeting
- Receive Council guidance on surface water design manual recommendation

NPDES Stormwater Permit

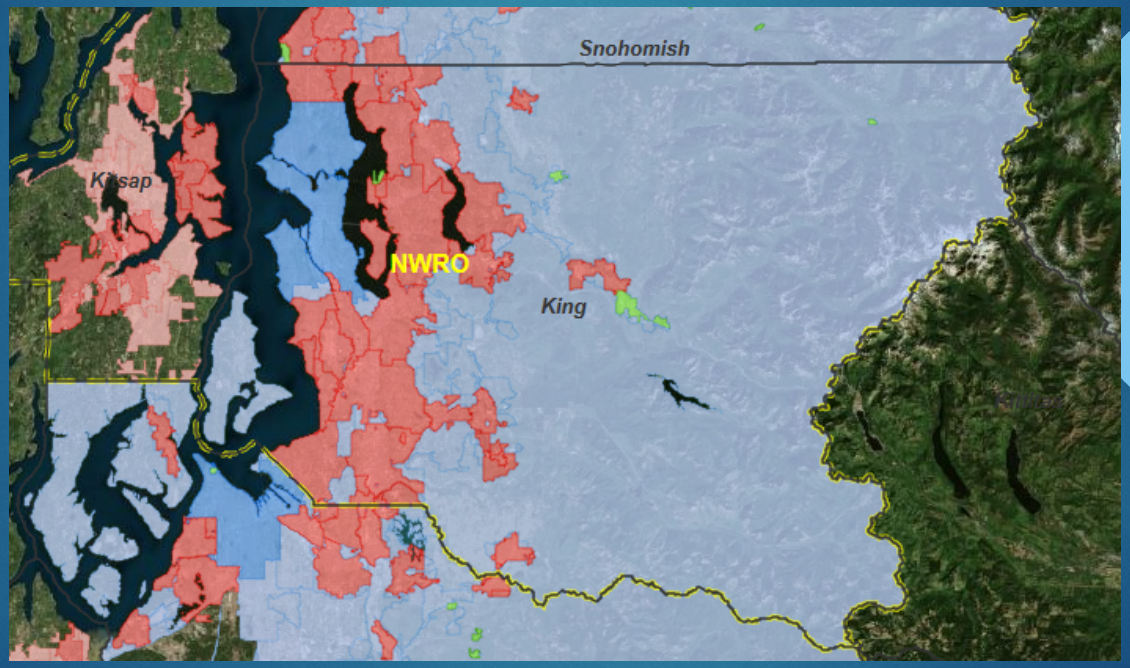
Adopt

Code Implementing Ecology Manual or Equivalent

By

December 31, 2016

Jurisdictions are in this Together



Phase I and Phase II Permit Coverage – King County

Map Credit: WA State Department of Ecology

What we've done since July 5th

- Presented to Council Committees:
  - Public Works/Parks/Human Services (twice)
  - Planning and Economic Development
- Internal staff discussion and analysis
- Modeled project examples using both manuals
- Analyzed impact on construction cost of CIP and private development
- Identified potential impacts on lifecycle and maintenance costs

Surface Water Design Manual Choices

Comparison of NPDES and City Goals for Stormwater Management

NPDES Permit/Ecology

- Water Quality

Kirkland (and King County)

- Water Quality
- Flood Reduction
- Fish Habitat

Surface Water Design Components

REQUIRED PER NPDES PERMIT

- Minimum requirements for addressing:
  - Low Impact Development
  - Flow Control
  - Water quality treatment
- Requirements and guidance for pollution source control
- Project/plan review and approval process

EXISTING KIRKLAND REQUIREMENTS (staff recommendation is to keep)

- Flood protection/mitigation
- Conveyance system design and protection

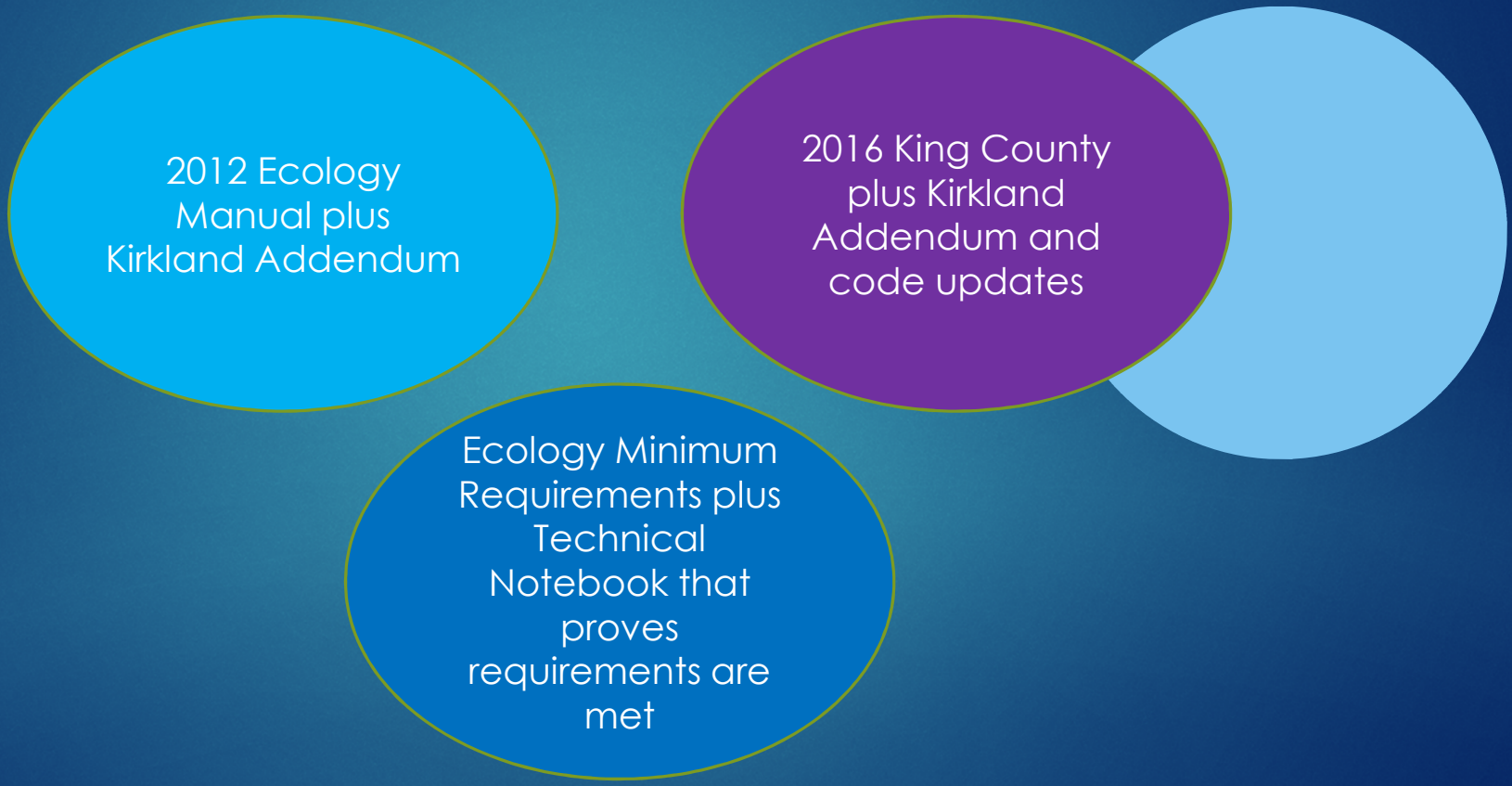
Why have flood protection and conveyance requirements?

- Few major flooding problems
- Standard in the region

Policy Direction

- Confirm continuation of existing conveyance and flood protection requirements

Choices for Implementation



Approach of Neighboring Cities

City	Approach	Comments
Bellevue	Ecology Minimum Requirements plus Technical Notebook	Rare approach
Bothell	King County package	Currently using Ecology and doesn't like it, used King County in past
Issaquah	Ecology Manual plus technical notebook	
Redmond	Ecology Manual plus Technical Notebook	Watershed planning approach
Renton	King County package	Customized KC Manual into Renton Technical Notebook
Seatac	King County package	May alter detention sizing requirements
Shoreline	Ecology Manual with Technical Notebook	Adopted Conveyance Chapter from King County

Package Choices

King County Package (Staff Recommendation)

- 2016 King County Surface Water Design Manual
- 2016 King County Stormwater Pollution Prevention Manual
- Cross-reference KMC/King County Codes
- Kirkland addendum

Ecology Package

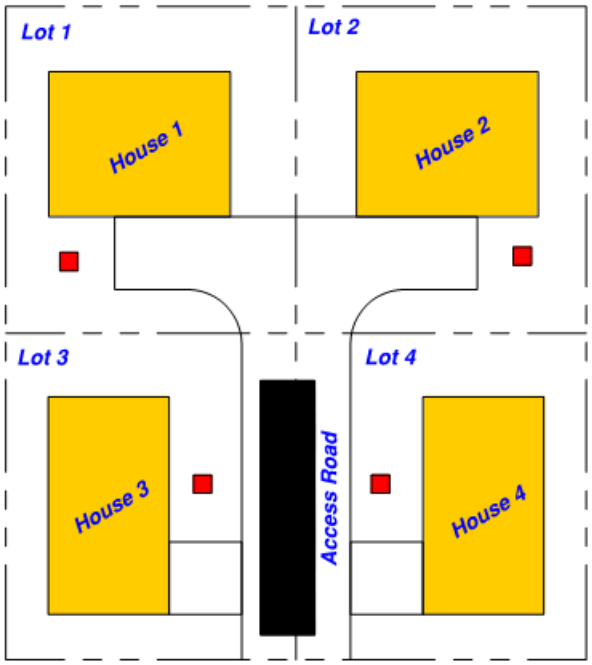
- 2012/2014 Stormwater Management Manual for Western Washington(Ecology Manual) (includes a chapter on pollution source control)
- Cross-reference Kirkland/Ecology plan review procedures
- Technical notebook for conveyance and flood protection requirements (if policy decision is to retain conveyance / flood protection) and implementation details

Overview – With Either Manual…

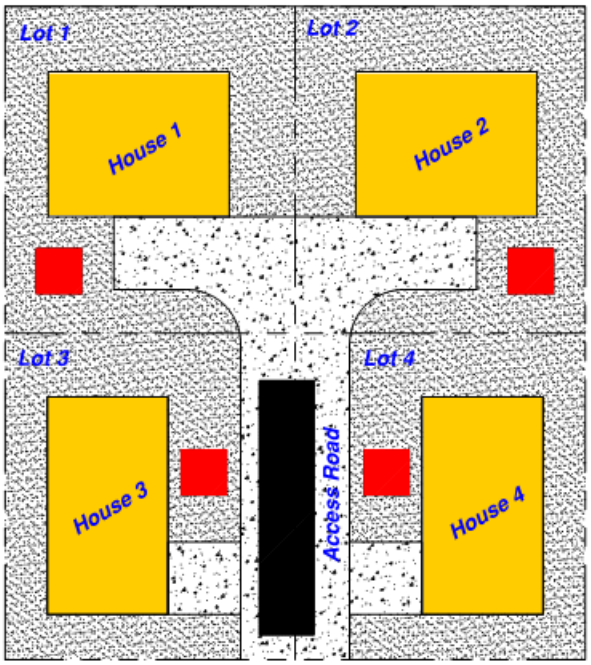
- There will be a ***significant*** environmental benefit because of the use of LID
- Increased scrutiny of facilities proposed near landslide hazard areas
- New regulations will cost more for private development and for CIP projects
- There will be more up front study
- Review costs will increase
- Maintenance and inspection needs will change

Low Impact Development (LID)

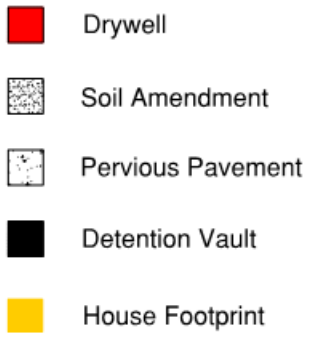
New Site Layout under Either Manual



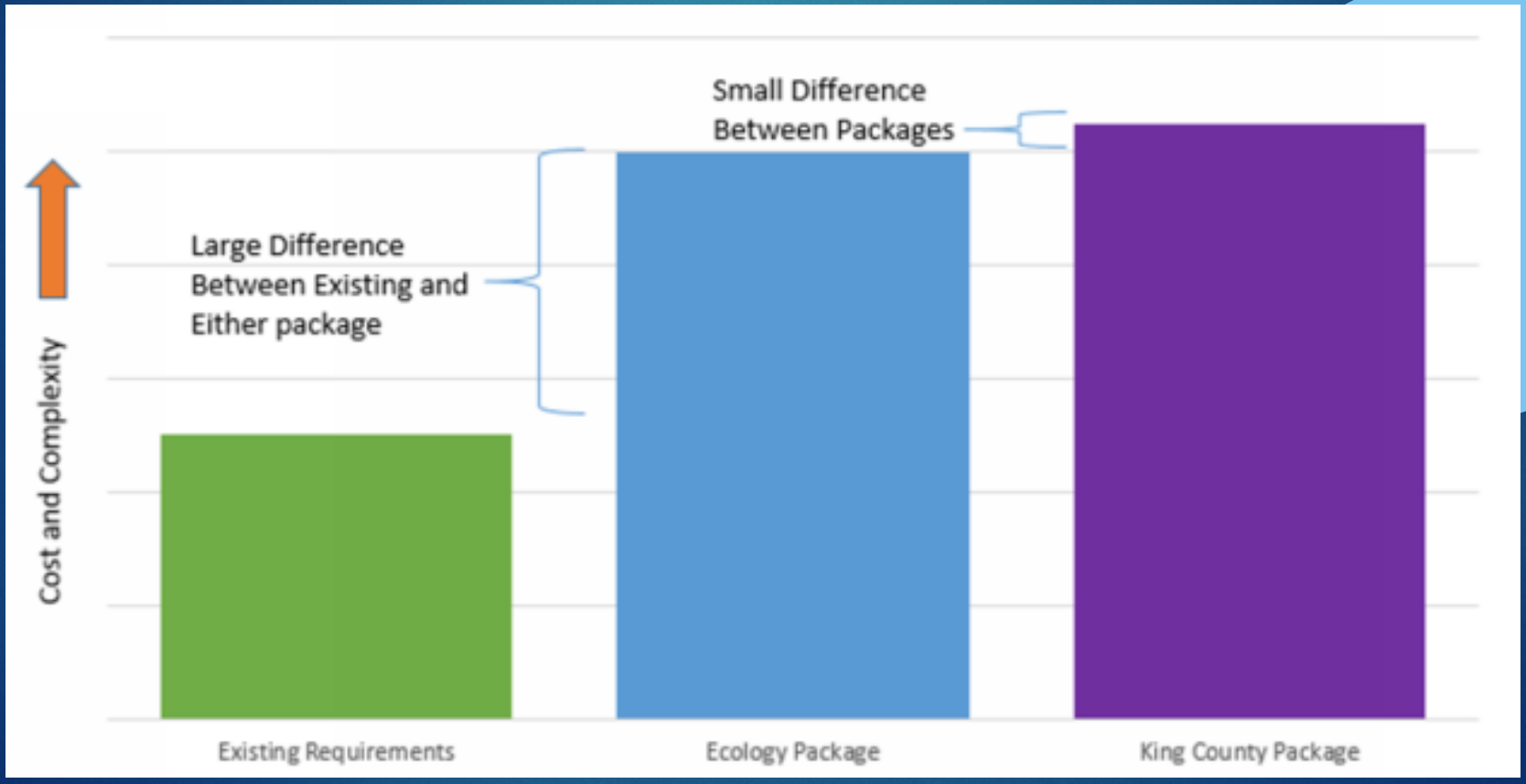
Current Manual
2009 King County Manual



New Manual
Either 2016 King County Manual
or 2012 Ecology Manual



Relative Difference Between Requirements



Technical Differences Between Packages

- King County package requires slightly larger flow control facilities for projects on certain soil types
- King County package requires flow control facilities for certain small projects where Ecology package does not
- King County LID list is more flexible and would result in less permeable pavement

Project Examples

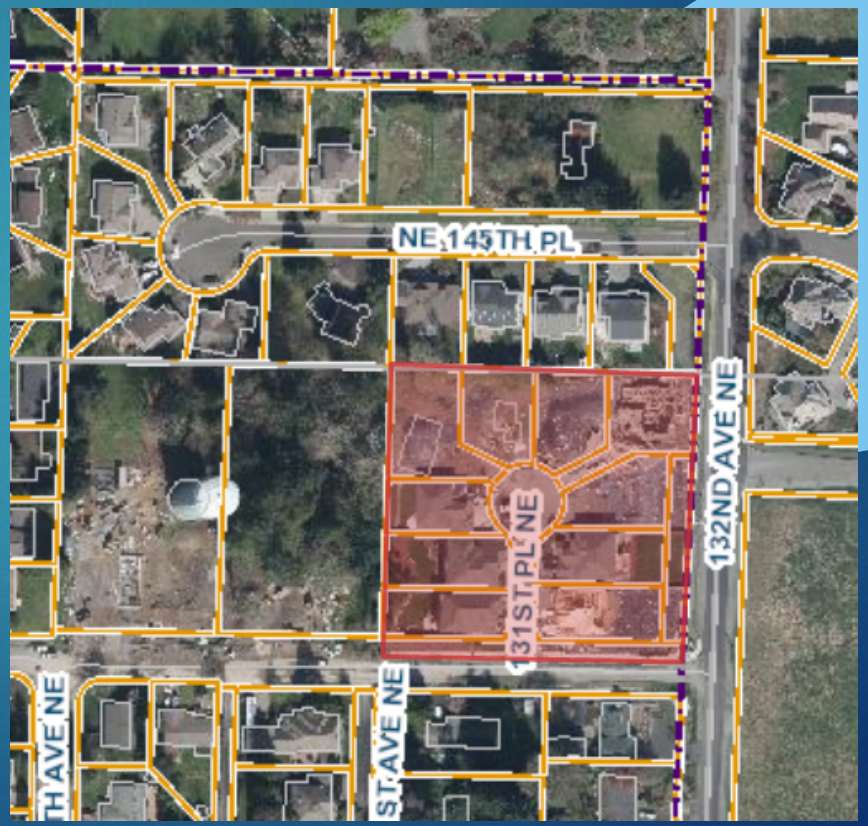
- These examples look at the differences **BETWEEN** packages
- Caveat: every design is different especially with LID – soil conditions, groundwater levels, list/modeling change what type and size of facilities are provided.

Private Development Example #1: Beautiful Day Short Plat

- **Overview**: Existing single lot tears down home and subdivides into two lots
- **King County Manual** requires detention vault and LID BMPs
- **Ecology Manual** requires LID BMPs only

Private Development Example #2: Baker/Kirkland Ridge Plat

- **Overview**: Two existing lots subdivide into a 10 lot plat
- **King County Manual** requires detention vault, water quality treatment, and LID BMPs
- **Ecology Manual** requires smaller detention vault, water quality treatment, and LID BMPs



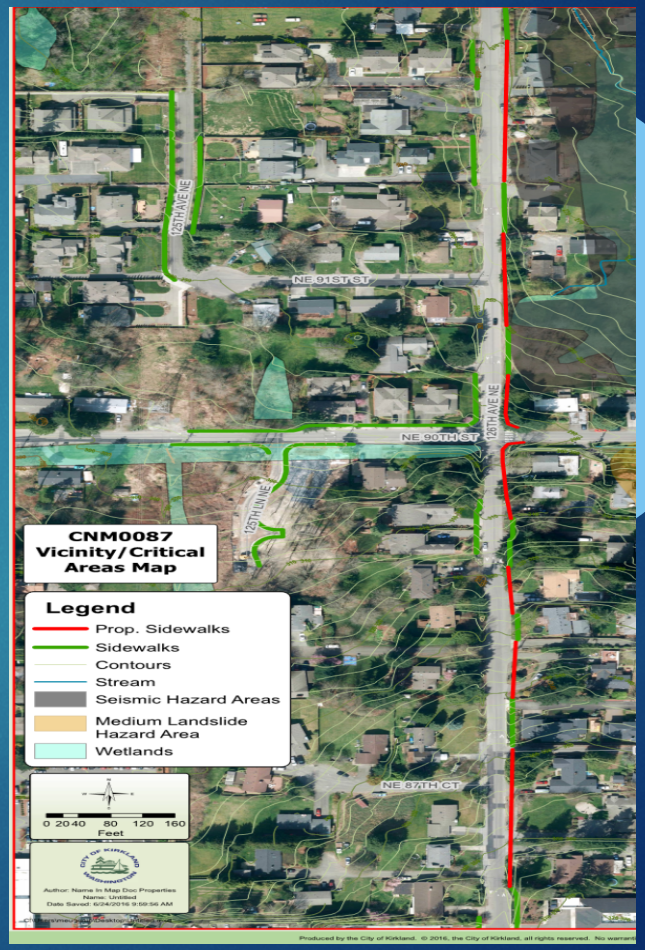
Plat Comparisons

Projects	Manual Option	Construction Cost	Annual Maintenance Cost	Expected Life Cycle Cost	City Review Time
Beautiful Day Short Plat (2 lots)	**King County**	Higher	Equal	Lower	Higher
	Ecology	Base	Base	Base	Base
Baker / Kirkland Ridge Plat (10 lots)	**King County**	Equal	Lower	Lower	Equal
	Ecology	Base	Base	Base	Base

Note: Base is higher in cost and complexity than current design requirements

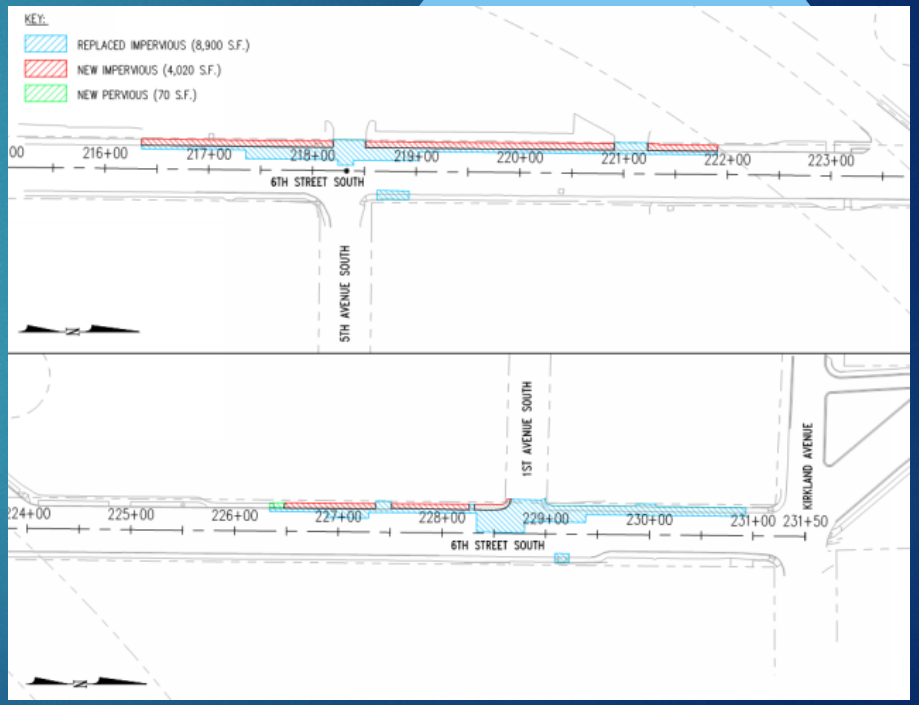
Right of Way/Transportation CIP: 126th School Walk Route

- **Overview**: ¼-mile Sidewalk Project
- **King County Manual** requires evaluation of flow control and water quality (facility will not be required) and provide LID BMPs
- **Ecology Manual** requires evaluation of flow control and water quality (facility will not be required) and provide LID BMPs



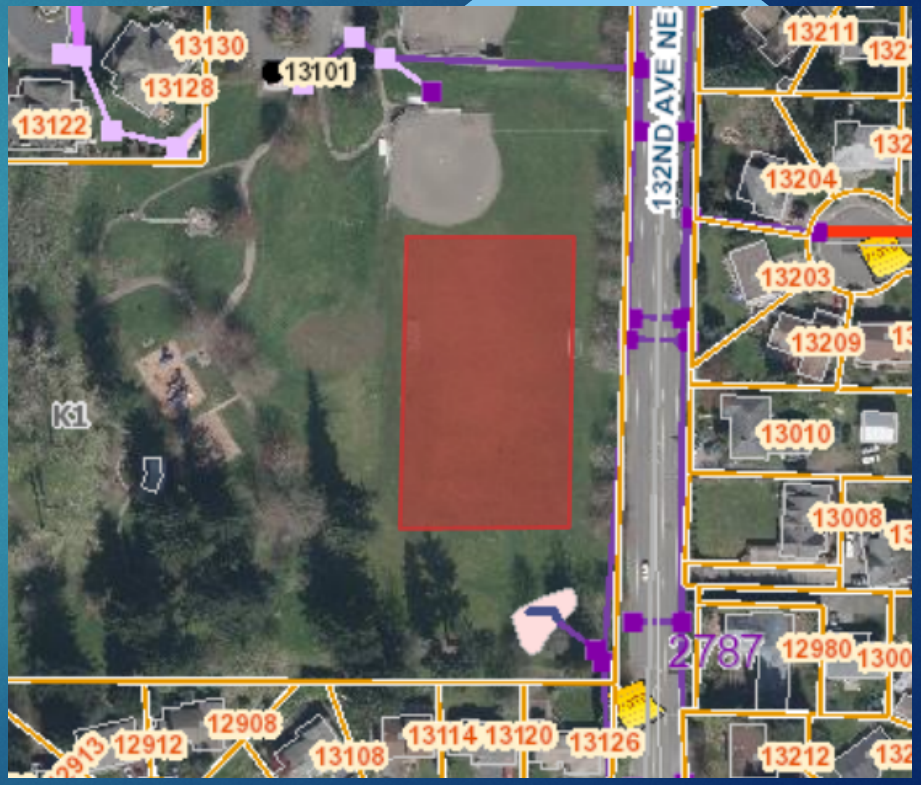
Right of Way/Transportation CIP: 6th St Sidewalk

- **Overview**: ½- mile Sidewalk Project
- **King County Manual** requires evaluation of flow control and water quality (facility will not be required) and provide LID BMPs
- **Ecology Manual** requires LID BMPs



Parcel-Based CIP: 132nd Square Park Turf Field

- **Overview**: 1-acre Artificial turf soccer field installation
- **King County Manual** requires detention, water quality treatment and LID BMPs which are provided by 11" of gravel storage beneath the field
- **Ecology Manual** requires detention, water quality treatment and LID BMPs which are provided by 11" of gravel storage beneath the field

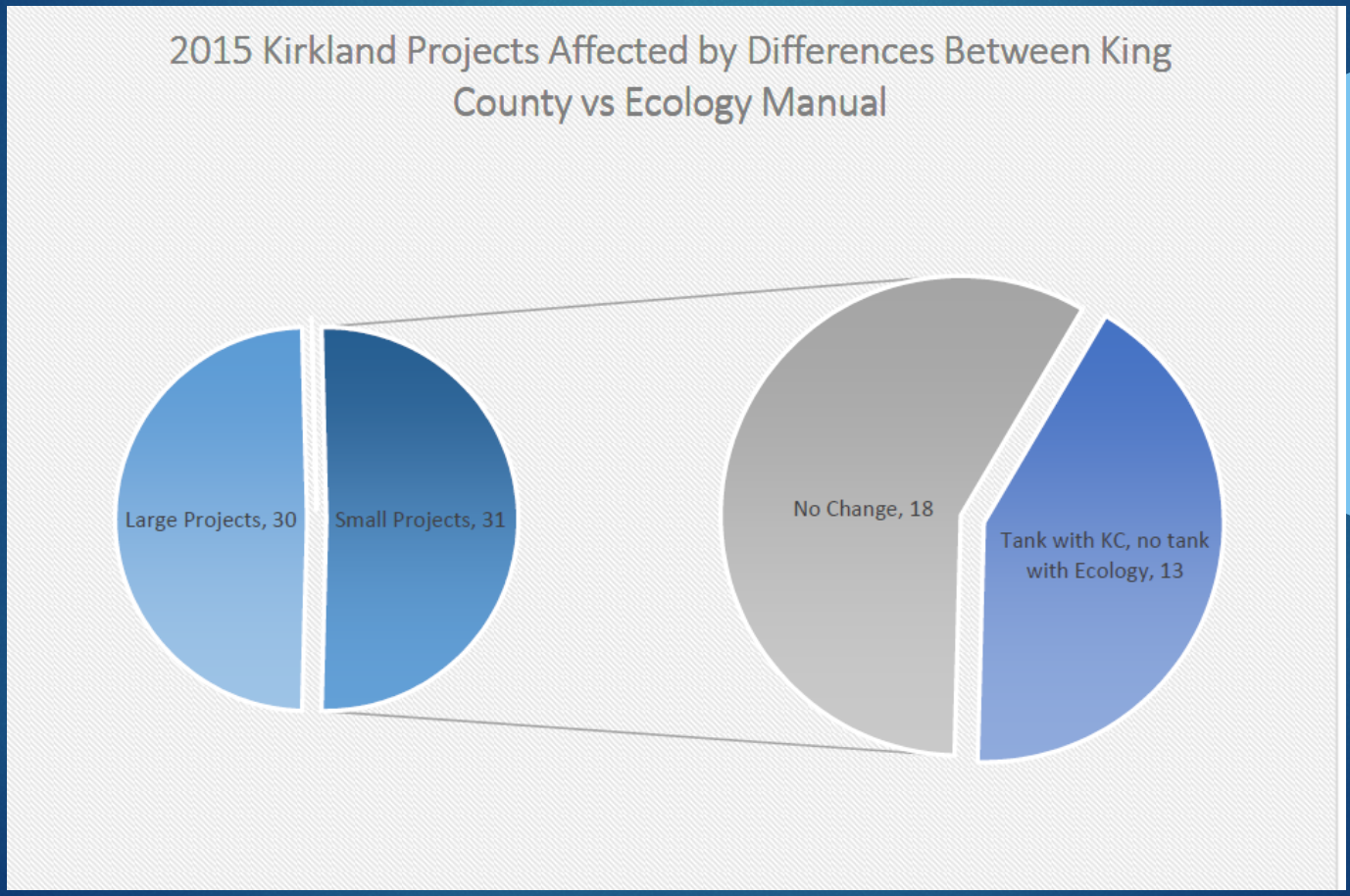


CIP Comparison

Projects	Manual Option	Construction Cost	Annual Maintenance Cost	Expected Life Cycle	City Review Time
NE 126th Street School Walk Route	**King County**	Equal	Equal	Equal	Equal
	Ecology	Base	Base	Base	Base
6th St Sidewalk	**King County**	Equal	Equal	Equal	Higher
	Ecology	Base	Base	Base	Base
132nd Square Park	**King County**	Equal	Equal	Equal	Equal
	Ecology	Base	Base	Base	Base

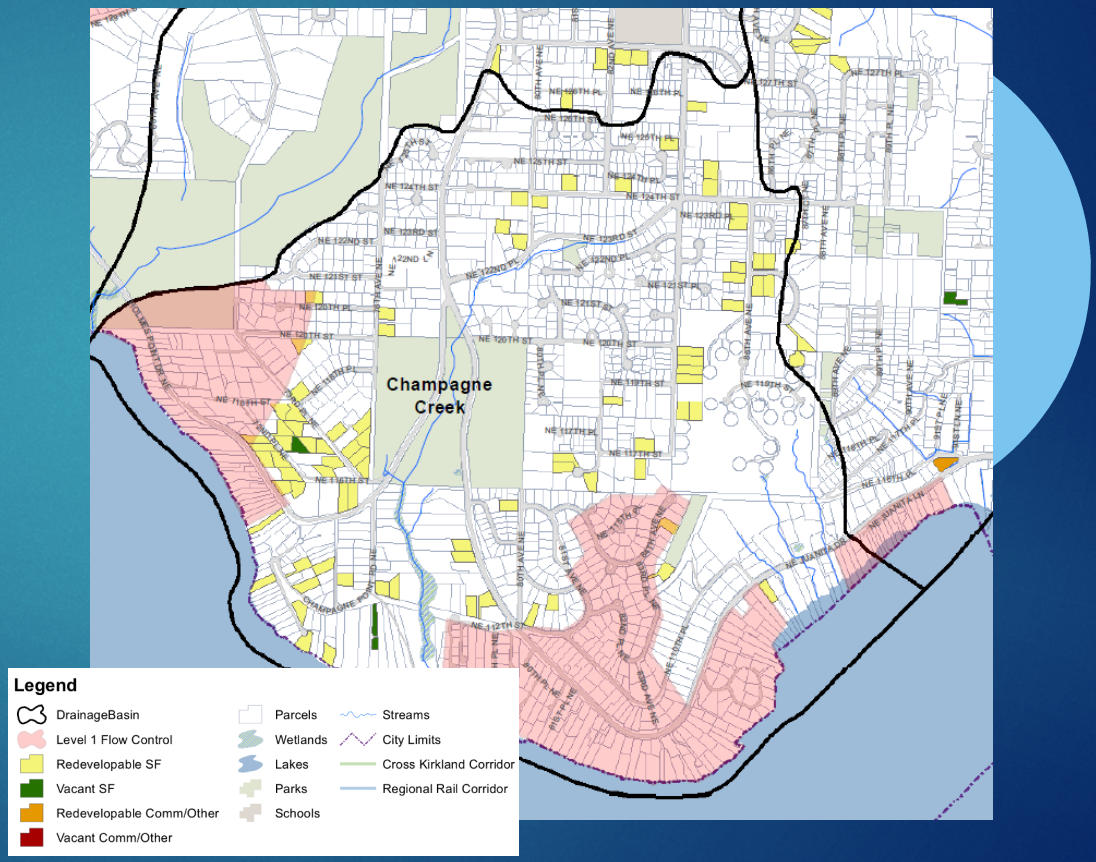
Note: Base is higher in cost and complexity than current design requirements

Flow Control for Small Projects



Flow Control for Small Projects

- 443 parcels total by 2035 that would have to provide tanks under King County but would not have to under Ecology
- Most are in Forbes (124) Juanita (92) and Champagne (84) watersheds
- This is about 1/3 of overall number of parcels likely to develop/redevelop in City



Considerations for Choosing a package

- Construction cost
- Lifecycle cost
- Maintenance Cost
- Long-term viability of LID – King County package more skeptical
- Ease of use/ Development Community preference
- Continuity (currently use King County SWDM)
- Technical support

Potential Alterations to Packages

- Need to be careful …keep package intact
- But can alter items that are above-and-beyond Ecology requirements or
- Add items not addressed by Ecology

Possible Addition Ecology Package

- Add city code and requirements for conveyance protection and flood reduction

Possible Alterations
King County Package

- Option 1: Adopt As-Is
- Option 2: Adopt Ecology threshold for requiring flow control
  - This would result in no tanks for the smaller projects or short plats
- Option 3: Fee-in-Lieu (could combine with Options 1 or 2)

RECOMMENDATION

- Adopt King County Package As-Is (Option 1)
- Return with information/recommendation on Fee-in-Lieu (Option 3) in first half of 2017
- Conduct Study

Policy Direction

- King County or Ecology Package?
- If King County, which option?
  - Option 1: Adopt As-Is
  - Option 2: Adopt Ecology threshold for requiring flow control
    - This would result in no tanks for the smaller projects or short plats
  - Option 3: Fee-in-Lieu (could combine with Options 1 or 2)

Proposed Study

- LID Feasibility Tools
- Other means of implementing LID
- Evaluation of flow control sizing under both manuals

Next Steps

- Additional Outreach to public in October
- Present package for adoption at regular Council meetings in October/November
- Continue to evaluate cost and program impacts as part of 2017-2018 budget
- Requirements effective January 1, 2017

Summary of Project Comparisons

- Private development and Parcel Based CIP projects:
  - Initial construction cost may be slightly higher in some cases for King County
  - Replacement costs may be lower with King County because would result in less permeable pavement
  - Environmental/Community benefits of King County include flood protection which Ecology Manual does not, and more stream protection than Ecology Manual for small projects
- CIP projects in Right-Of-Way:
  - Design and construction costs for projects within the right of way will increase equally under both manuals
  - Lifecycle/Replacement costs will increase equally under both manuals
  - Environmental/Community benefits for projects in the right of are about the same under both manuals
  - Parcel-based CIP projects would mimic private development projects – see above

Maintenance and Lifecycle Costs

- Don't know but overall, but do know:
  - Permeable pavement has lower life expectancy and increased maintenance costs
  - We know that there will be more LID facilities
  - Many LID facilities will be private but we need to inspect

Comparing Packages - Summary

Private Development and Parcel Based CIP Projects

	Ecology Manual	King County Manual
Construction Cost	Base	Higher
Maintenance Cost	Base	Lower
Life Cycle Cost	Base	Lower

CIP Projects in the Right of Way

	Ecology Manual	King County Manual
Construction Cost	Base	Equal
Maintenance Cost	Base	Equal
Life Cycle Cost	Base	Equal

Fee-In-Lieu

Would apply ONLY to projects that would not need to provide flow control per Ecology Manual

Pros

- Lowers cost of development/housing
- Allows for watershed scale planning and potentially more beneficial facility placement
- Fewer small facilities for city to inspect and maintain

Cons

- More expensive for City to construct flow control, especially if done later
- Flow control would be delayed resulting in incremental stream degradation
- May not collect enough revenue to do planning much less construct facilities
- Significant staff time to develop program